A Virtual Mirror for the Study Of Historical Fashion

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Abstract:

Augmented reality (AR) has been widely discussed within the archeology field for some time now. Different systems for archeological applications have been proposed. Some of them produced promising results. However, the application of AR technology to archeology needs not be constrained to archeological sites as it has thus far been the case. The main purpose of this research is to create tools that will allow the first-hand study and experimentation of archeological fashion by actually trying on the clothing. The main thesis of this work is that fashion captures many aspects of a culture as a whole and thus its study may shed further light on understanding the culture as it represents the culture's inner spirit. Thus, this work focuses on applying AR technologies to the study of fashion to understand its various aspects, such as the clothing itself, hair styles, make-up, and a variety of other factors.

The purpose of this work is twofold: 1) to create and test real-time computer graphics tools useful to visualize clothing, hair styles and make up in the form of a virtual mirror, and 2) evaluate the resulting tools in the domain of Qing Dynasty women's fashion. It is anticipated that the main contribution of the work is to create a viable platform to help history researchers, and perhaps the general public, to understand the intricacies of the Qing Dynasty women's fashion by trying it on.

Ancient Chinese articles of clothing from various dynasties developed into unique fashion systems that encompassed a variety of articles such as crowns, hats, shoes, socks and other wearable items. Fashion design changed gradually along with the development of production methods and changes in people's life styles. Thus, the research of historical changes in fashion might shed light on such production methods and life styles of each dynasty. It is a common practice to use fashion as an important criterion to distinguish dynasties. And although archeological costumes preserved till today aren't many; in research, besides material objects, personas in ancient times' sculptures and drawings are often important references as well.

China traditional dress has many parts, including clothing, jewelry, shoes, and other accessories. It is possible to develop a database for items in any of these categories by collecting information from various data sources such as photos or 3D-scans of sculptures to develop realistic 3D representations of various clothing items.

An experimental system based on Microsoft's Kinect sensor is being developed which can superimpose clothing items from the database on a user's image in real-time. This system, gives the impression of a 3D virtual mirror to the user. It allows users to choose their favorite clothing, accessories, and shoes on the screen. It also allows them to choose different dynasties clothing or hairstyle, thus giving them the freedom to mix and match clothing items to experience, first hand,

cultural experiences around historical Chinese clothing.

When a customer enters a clothing store, in addition to the selection of favorite clothing, clothing size selection is also an important issue. Usually customers will use their experience to choose for their size, or might even try the clothes on to determine whether the size is appropriate. This method is not very convenient or efficient. However, a virtual dressing room might be able to determine what size is appropriate for the customer.

To solve this problem, this research proposes the use of two Kinect sensors, one on the front and the other on the side. The proposed system evaluates customer body height according to head/foot joints and the depth information using the front Kinect. It then calculates the possible waist length according to the oval perimeter using the width around the Hip Center joint from the front and left side Kinects. And, finally, we calculate the size of the body based on information from two Kinects depth of the region. Then we use a rule-based approach to determine the user's scale.

This paper describes some of the intricacies of fashion during the Qing Dynasty and gives a brief overview of research being done in that era. It describes how researchers gather the data to do the research and introduces some hypotheses as to how a AR might help overcome some of the problems faced in their research.